

SAFETY DATA SHEET

Section 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: **d-Limonene (Technical Grade)**
Substance Name (EINECS): **(R)-p-mentha-1,8-diene**
Common Names: **d-Limonene**
Product Code: **301001**
Classification: **Substance**
Product Uses: **Adhesive resins, flavors, fragrances, solvents and degreasing agents**
Manufacturer: **Deep South Chemical, Inc.**
Company Address: 229 Millstone Road
Broussard, LA 70518
1-337-837-9931
E-mail: info@deep-south-chemical.com
Website: www.deep-south-chemical.com

For emergencies in U.S. call Chemtrec anytime at 1-800-424-9300
Outside U.S. call Chemtrec Collect at 1-703-527-3887

Section 2: HAZARDS IDENTIFICATION

This product is considered hazardous according to OSHA's Hazard Communication Standard as well as European Union Directives 67/548/EEC and 1999/45/EC and international GHS standards and was prepared using Regulations 1907/2006 and 1272/2008.

Per Regulation 67/548/EEC

Indication of principle danger

N – Dangerous to the Environment
Xn – Harmful

Most important hazards

R10 – Flammable
R38 – Irritating to skin
R43 – May cause sensitization by skin contact
R50/53 – Very toxic to aquatic organisms; may cause long term adverse effects in the aquatic environment
R65 - Harmful: may cause lung damage if swallowed

Per Regulation 1272/2008

Classification

2.6 – Flam. Liq. 3
3.2 – Skin Irrit. 2
3.4.S – Skin Sens. 1
3.10 – Asp. Tox. 1
4.1.A – Aqu. Acute 1
4.1.C – Chron. Acute 1

Danger!

Hazard statements

H226 – Flammable liquid and vapor
H304 – May be fatal if swallowed and enters airways
H315 – Causes skin irritation
H317 – May cause an allergic skin reaction
H410 – Very toxic to aquatic life with long lasting effects

Graphical indication of hazards



Graphical indication of hazards



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Precautionary Statements

P210 – Keep away from heat/sparks/open flames/hot surfaces. — No smoking
P273 – Avoid release to the environment
P280 – Wear protective gloves/protective clothing/eye protection/face protection
P301 + P310 – IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P302 + P352 – IF ON SKIN: Wash with plenty of soap and water
P331 – Do NOT induce vomiting
P332 + P313 – If skin irritation occurs: Get medical advice/attention
P501 – Dispose of contents/containers in accordance with local/regional/national/international regulations

OSHA Regulatory Status:

This material is combustible, which is defined as having a flash point of 37.8°C - 93.3°C (100°F- 200°F). Combustible materials are hazardous according to the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

<u>Component</u>	<u>CAS #</u>	<u>EC #</u>	<u>% by Wt.</u>	<u>Classification</u>
d-Limonene	5989-27-5	227-813-5	100	Xn; N; R10-38-43-50/53-65

ECHA Registration #: 01-2119529223-47-0006

Hydrocarbons %: 98

See Section 2 for the full text of the R phrases mentioned in this Section.

Section 4: FIRST AID MEASURES

Eye Contact: Remove any contact lenses at once. Flush eyes with water for at least 15 minutes. If irritation persists, seek medical attention.

Skin Contact: Wash affected area with copious amounts of soap and water. If irritation develops, seek medical attention.

Inhalation: If symptoms of overexposure are experienced, move to fresh air.

Ingestion: Seek medical attention immediately. DO NOT induce vomiting. Rinse mouth with water. DO NOT offer water or anything to drink that might cause vomiting. DO NOT administer anything by mouth to an unconscious person. DO NOT leave victim unattended.

General: As with any chemical, employees should thoroughly wash hands with soap and water after handling this material.

Section 5: FIRE FIGHTING MEASURES

Suitable Extinguishing Media: Carbon dioxide, foam or dry chemical. Caution: Carbon dioxide will displace air in confined spaces and may create an oxygen deficient atmosphere.

Unsuitable Extinguishing Media: Water.

Products of Combustion: Forms acrid fumes, carbon monoxide and carbon dioxide.

Protection of Firefighters: Vapors may be irritating to eyes, skin and respiratory tract. Firefighters should wear self-contained breathing apparatus (SCBA) and full fire-fighting turnout gear.

Section 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: Use personal protection recommended in Section 8. Product is slippery when spilled. Isolate the hazard area. Deny entry to unnecessary and unprotected personnel.

Environmental Precautions: Prevent further leakage or spillage. Keep away from drains, surface- and ground-water and soil.

Methods for Containment: Dike spill area and cap leaking containers as necessary to prevent further spreading of spilled material. Absorb spilled liquid with suitable material such as dirt or sand.

Methods for Clean Up: Eliminate all ignition sources. Use equipment rated for use around combustible materials. Place in appropriate disposal container. Oil soaked rags may spontaneously combust; place in appropriate disposal container.

Other Information: There are no special reporting requirements for spills of this material.

Section 7: HANDLING AND STORAGE

Handling

Keep away from heat, sparks and flame. Open container slowly to release pressure caused by temperature variations. Do not allow this material to come in contact with eyes. Avoid prolonged contact with skin. Use in well-ventilated areas. Do not breathe vapors. Drum lining may occasionally chip and fall to the bottom of

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container; product should be filtered or strained before blending or repackaging. As with any chemical, employees should thoroughly wash hands with soap and water after handling this material.

Storage

Product may be packaged in phenolic-lined steel containers or fluorinated plastic containers. Store in a well ventilated area with proper sprinkler/fire deterrent system. Storage temperature should not exceed the flash point for extended periods of time. Keep container closed when not in use. Air should be excluded from partially filled containers by displacing with nitrogen or carbon dioxide. Do not cut, drill, grind or weld on or near this container; residual vapors may ignite.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

d-Limonene 8h TWA=30 ppm (AIHA Standard)

Engineering Controls: Normal room ventilation is usually adequate. Provide exhaust ventilation or other engineering controls to keep the airborne concentration below any regulated limits. Keep away from sparks and flames.

Eye/Face Protection: Wear safety glasses or goggles.

Skin Protection: Nitrile gloves are recommended. Boots, apron, or bodysuit should be worn as necessary.

Respiratory Protection: Not normally required. If adequate ventilation is unavailable, use NIOSH approved air-purifying respirator with organic vapor cartridge or canister.

General Hygiene Considerations: Wash hands thoroughly after handling. Have eyewash and emergency shower facilities immediately available. Launder contaminated clothing before reuse.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear liquid

Color: Colorless to pale yellow

Odor: Citrus aroma

Physical State: Liquid

pH: None

Boiling Point: 176°C (349°F)

Melting Point: -96°C (-140°F), thickens at -78°C (-108°F)

Specific Gravity: 0.838 to 0.843 at 25°C (77°F)

Refractive Index: 1.471 to 1.474 at 20°C (68°F)

Optical Rotation: +96° to +104° at 25°C (77°F)

Vapor Pressure: <2mmHg at 20°C (68°F)

Flash Point (Closed cup) : >43°C (>110°F)

Flammable Limits: LEL approx. 0.7%, UEL approx. 6.1%

Auto ignition Temperature: 237°C (458°F)

Solubility in Water: Insoluble

Evaporation Rate: 0.2 (BuAc=1)

Partition coefficient (n-octanol/water): Kow = 4.23 (d-limonene)

Volatile Organic Compound (VOC) Content: >95% by volume

Note: These properties represent a typical sample of the product, but actual values may vary. Certificates of Analysis and Specification Sheets are available upon request.

Section 10: STABILITY AND REACTIVITY

Stability: Stable.

Conditions to Avoid: Keep away from heat, sparks and flames.

Incompatible Materials to Avoid: Strong oxidizing agents and strong acids, including acidic clays, peroxides, halogens, vinyl chloride, and iodine pentafluoride.

Hazardous Decomposition Products: Oxides of d-limonene, which can result from improper storage and handling, are known to cause skin sensitization. No decomposition if stored properly.

Possibility of Hazardous Reactions: BHT, an antioxidant, can be added to prevent oxidation. Avoid long-term exposure to air. If storing partially-filled containers, fill headspace with an inert gas such as nitrogen or carbon dioxide.

Section 11: TOXICOLOGICAL INFORMATION

Acute Effects

d-Limonene has been shown to have low oral toxicity (LD₅₀>5 g/kg) and low dermal toxicity (LD₅₀> 5g/kg) when tested on rabbits. d-Limonene has also shown low toxicity by inhalation (RD₅₀>1 g/kg) when tested on mice. Product may be a skin and eye irritant. Inhalation may cause irritation of the nose, throat, and respiratory tract. LC₅₀: Not established.

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Chronic Effects

This product is not classified as a carcinogen by IARC or U.S. ACGIH, NTP or OSHA. This product has not been shown to produce genetic changes when tested on bacterial or animal cells. This product does not contain known reproductive or developmental toxins.

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity: This product may be very toxic to aquatic life. However due to the physical properties of the product (density and volatility) it will not remain in the environment for an extended period of time.

Persistence/Degradability: Product is readily biodegradable.

Bioaccumulation/Accumulation: The octanol-water partition coefficient (Kow) for d-limonene is 4.23. The potential for bioaccumulation in the environment is possible. However, the metabolism of citrus extractives into non-accumulating metabolites greatly reduces the risk of bioaccumulation.

Mobility in Environment: Citrus extractives volatilize rapidly. Citrus extractives are expected to volatilize from soil or water to the air and oxidize to carbon dioxide in the presence of sunlight.

Section 13: DISPOSAL CONSIDERATIONS

Disposal: Incinerate or dispose of in accordance with local regulations. Oil soaked rags or contaminated packaging should be disposed of properly to prevent spontaneous combustion.

Section 14: TRANSPORT INFORMATION

The listed transportation classification does not address regulatory variations due to changes in package size, mode of shipment or other regulatory descriptions.



Road – ADR / DOT (ground); RID (rail)

Proper Shipping Name: TERPENE HYDROCARBONS, N.O.S.

Hazard Class: 3

UN Number: UN2319

Packing Group: III

Label/Placard: 3 Flammable Liquid

Label/Placard: exception §173.150(f) applies (DOT only)

Sea – IMDG (sea)

Proper Shipping Name: TERPENE HYDROCARBONS, N.O.S.

Hazard Class: 3

UN Number: UN2319

Packing Group: III

Marine Pollutant: Yes

Label/Placard: 3 Flammable Liquid

Air – IATA / ICAO (air)

Proper Shipping Name: TERPENE HYDROCARBONS, N.O.S.

Hazard Class: 3

UN Number: UN2319

Packing Group: III

Label/Placard: 3 Flammable Liquid

Section 15: REGULATORY INFORMATION

Global Inventories

This product is included in the following inventories:

USA (TSCA)

Canada (DSL)

Europe (EINECS/ELINCS/Polymer/NLP)

Australia (AICS)

Korea (KECL)

Japan (ENCS)

China (IECSC)

New Zealand (HSNO)

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The U.S. FDA lists d-Limonene as GRAS in 21 CFR sections 182.20 and 182.60

United States Regulations

Proposition 65: California Safe Drinking Water and Toxic Enforcement Act of 1986

This product is not known to contain any chemicals currently listed as carcinogens or reproductive toxins under California Proposition 65 at levels which would be subject to the proposition.

SARA Title III (Section 313)

This substance contains no materials subject to the reporting requirements of SARA Title III (Section 313).

Section 16: OTHER INFORMATION

NFPA 704: National fire Protection Association

Health – 1 (slight hazard)

Fire – 2 (moderate hazard)

Reactivity – 0 (minimal hazard)

This product was produced with Good Manufacturing Practices. It is a by-product of citrus, entirely of natural origin, and to the best of our knowledge contains no artificial flavors, sulfites, nitrites, or pesticide residue exceeding tolerances established by the U.S. FDA. It has not been adulterated or misbranded. It does NOT contain lead, cadmium, mercury, or hexavalent chromium or come in contact with these chemicals since it is a citrus derived essential oil produced by steam/vacuum distillation. Further, it is packaged in food grade containers with inert liners that do NOT contain lead, cadmium, mercury, or hexavalent chromium. It does NOT contain and is NOT manufactured with any of the Class I or II ozone-depleting substances listed under the United States Clean Air Act of 1990.

Legend

ACIGH – American Conference of Governmental Industrial Hygienists

ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road

AIHA – American Industrial Hygiene Association

BHT – Butylated Hydroxytoluene

CAS # - Chemical Abstracts Service

CFR – United States Code of Federal Regulations

DOT – United States Department of Transportation

EC# - European Commission (aka EINECS, European Inventory of Existing Commercial chemical Substances)

ECHA - European Chemicals Agency

FDA – United States Food and Drug Administration

GHS - Globally Harmonized System of Classification and Labelling of Chemicals

GRAS – Generally Recognized as Safe

IARC – International Agency for Research on Cancer

IATA – International Air Transport Association

ICAO – International Civil Aviation Organization

IMDG – International Maritime Code for Dangerous Goods

NFPA – National Fire Protection Association

NIOSH – United States National Institute for Occupational Safety and Health

NTP – United States National Toxicology Program

OSHA – United States Occupational Health and Safety Administration

RID – Regulations Concerning the International Transport of Dangerous Goods by Rail

TWA –Time Weighted Average

Caution: The user should conduct his/her own experiments and establish proper procedures and control before attempting use on critical parts.

Prepared by Deep South Chemical Company Technical Team

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